



# Design and Technology

Through our Design Technology curriculum, we aim to give opportunities for our pupils to design and make products to solve real and relevant problems.

Our curriculum is designed to help pupils to:

- Develop and draw upon their technical skills, building on their prior knowledge and understanding.
- Design, make and evaluate products in response to design briefs, exploring their own and others ideas.
- Create and test prototypes using practical skills and understanding.
- Use creativity and imagination to solve problems, evaluating their designs and developing a sense of pride in their finished work.
- Relate their learning to the wider world, evaluating past and present work and understanding its impact on the world.



## Reception Year

### Designing:

- Generate ideas through talking with others, looking at images and handling objects
- Follow simple adult instructions, involving several ideas or actions, to support their constructions

### Making

### Key Vocab

<b>Materials</b>	Uses a range of small tools including scissors and paint brushes; practise cutting skills with different tools Glues, sticks and joins different materials in different ways	<b>Design Construction Tools Decoration Battery Electricity Safety Cut Join</b>
<b>Textiles, Electricals &amp; Electronics</b>	Join textiles to make a simple puppet; add embellishment/decoration Investigate how things works including those with batteries or electricity Explore turning objects on and off	
<b>Construction &amp; Mechanics</b>	Make models using different materials; decorate and join in different ways Investigate the mechanism of a pop-up book	
<b>Computing</b>	Use IT to draw simple designs of their products	
<b>Food Technology</b>	Talk about everyday food e.g. fruit, vegetables, and how they are grown Explore different types of fruit and make an appealing fruit dish (eg fruit face or kebab) Make a savoury sandwich for picnic	
<b>Technical Knowledge</b>	Work towards simple goals and is able to wait for what they want Chooses tools that are most appropriate for the task	

### Evaluating: Pupils should be given the opportunity to:

- Share their creations, explaining the processes they have used and the reasons for their choices
- Talk about any improvements they would make next time

### Reception Designers should be able to

- Prepare some simple food using cutting implements
- Use a range of materials and joining techniques to create models
- Talk about their constructions and give reasons for their choices
- Operate an object with switches and investigate how it works



**Year 1**

**Designing:**

- Generate, develop, model and communicate simple ideas through talking, drawing, and IT to present a design brief
- Design functional products for themselves and others

**Making**

**Key Vocab**

<b>Materials</b>	<p>Cut materials safely with increasing accuracy using different tools</p> <p>Use tools for different purposes: cutting, sticking, curling, bending, joining, etc.</p> <p>Measure and mark out</p> <p>Select and use a range of materials and components (paper, card, plastic, wood) according to their characteristics</p> <p>Build structures by selecting appropriate materials and investigating ways to strengthen them</p>	<p><b>Strengthen</b></p> <p><b>Textile</b></p> <p><b>Running stitch</b></p> <p><b>Ingredients</b></p> <p><b>Levers</b></p> <p><b>Drill</b></p> <p><b>Stability</b></p> <p><b>Measure</b></p>
<b>Textiles, Electricals &amp; Electronics</b>	<p>Use textile templates to create an object</p> <p>Thread and use a needle safely; join material using a simple running stitch</p> <p>Diagnose faults in battery operated devices such low battery strength</p>	
<b>Construction &amp; Mechanics</b>	<p>Use materials to practice drilling, screwing, gluing materials to strengthen a product</p> <p>Create products using levers and wheels</p> <p>Use a range of tools and equipment such as cutting and joining to allow movement</p>	
<b>Computing</b>	<p>Use IT to plan a design image</p>	
<b>Food Technology</b>	<p>Handle ingredients and equipment safely and hygienically and use simple measures (eg cups) to weigh</p> <p>Follow instructions to prepare a mixture ready for cooking</p> <p>Understand where the ingredients they use for cooking come from</p>	
<b>Technical Knowledge</b>	<p>Begin to understand the basic principles of building and making structures stronger</p> <p>Explore the use of mechanisms eg levers and wheels for movement</p>	

**Evaluating:** Pupils should be given the opportunity to:

- Evaluate a range of existing products as a means of comparison to their own finished product
- Evaluate their own design against their original design brief through demonstration, explanation or discussion



### Year 1 Designers should be able to

- Handle ingredients and associated equipment safely and hygienically
- Describe how something works
- Make a product which moves
- Make a model stronger
- Explain to someone else how they want to make their product
- Choose appropriate resources and tools
- Make a simple plan before making something and record this using IT



**Year 2**

**Designing:**

- Generate, develop, model and communicate ideas through talking, drawing, and IT to present a design brief
- Design functional, purposeful, appealing products for themselves and others

**Making**

**Key Vocab**

<b>Materials</b>	Select from a range of tools and equipment to perform practical tasks including different ways of cutting safely Measure and mark out to the nearest centimetre Use joining techniques such as gluing, hinges or combining materials to strengthen	<b>Template</b> <b>Pulley</b> <b>Hinge</b> <b>Design brief</b> <b>Mechanism</b> <b>Nutrition</b> <b>Savoury</b>
<b>Textiles, Electricals &amp; Electronics</b>	Shape textiles using self-chosen templates Use simple sewing stitches to decorate textiles; thread and use a needle safely Diagnose faults in battery operated devices such as water damage or battery terminal damage	
<b>Construction &amp; Mechanics</b>	Use materials to practice drilling, screwing, gluing and nailing materials to strengthen a product Create a product with a winding mechanism Use a range of tools and equipment such as cutting and joining to allow movement	
<b>Computing</b>	Use IT to explore and present ideas for products	
<b>Food Technology</b>	Plan and prepare a savoury dish of nutritional value using electronic scales to weigh ingredients To use and be aware of a range of methods to prepare food: peeling, chopping, boiling, steaming etc. Understand where the food comes from	
<b>Technical Knowledge</b>	Build structures, exploring how they can be made strong, stiffer and more stable Explore the use of mechanisms eg for winding, in products	

**Evaluating:** Pupils should be given the opportunity to:

- Evaluate a range of existing products as a means of comparison to their own finished product
- Evaluate their own design against their original design brief through demonstration, explanation or discussion



### Year 2 Designers should be able to

- Think of an idea, present it to share with others and plan what to do next
- Choose tools and materials and explain why they have chosen them
- Join materials and components in different ways
- Explain what went well with their work
- Explain why they have chosen specific textiles, ingredients, materials, etc.
- Measure materials to use in a model or structure
- Describe where the ingredients they use come from



## Year 3

### Designing:

- Use research to develop a design that is innovative, functional and fit for purpose
- Generates, develops and models ideas through discussion, annotated sketches, prototypes, cross-sectional, exploded diagrams and computer-aided designs

### Making

### Key Vocab

<b>Materials</b>	Cut materials accurately and safely using a wider range of different tools Measure and mark out to the accurately using different units of measurement Apply appropriate cutting and shaping techniques	<b>Cross-section</b> <b>Annotate</b> <b>Prototype</b> <b>Electrical circuit</b> <b>Lever</b> <b>Joints: Butt,</b> <b>Mitre</b> <b>Hygienic</b> <b>Temperature</b>
<b>Textiles, Electricals &amp; Electronics</b>	Join textiles with appropriate stitching Combine different materials in different ways to make a new object Select the most appropriate techniques to decorate textiles Research using an electrical circuits in products that include lights, buzzers, etc.	
<b>Construction &amp; Mechanics</b>	Use materials, such a wood, as a frame for a construction; use different tools and joining techniques to strengthen the structure and add stability Begin to use joints such as a Butt or Mitre joint to join materials Use knowledge of transference of force to construct a product using a lever mechanism Use a range of tools and equipment such as cutting and joining to allow movement	
<b>Computing</b>	Use IT to design and present a product design	
<b>Food Technology</b>	Understand the components of a healthy diet Measure and prepare ingredients accurately and hygienically using appropriate utensils Assemble and cook ingredients of a savoury dish controlling the temperature	
<b>Technical Knowledge</b>	Use knowledge of how to reinforce more complex structures using different joining techniques Understand how they can use different techniques (circuits, mechanical systems) in their designs	

### Evaluating: Pupils should be given the opportunity to:

- Investigate and analyse a range of existing products
- Receive feedback on their designs and consider how this could help them make improvements
- Understand how key events and people in Design and Technology have helped shape the world



### Year 3 Designers should be able to

- Prove that their design meets some pre-set criteria
- Follow a step-by-step plan, choosing the most appropriate equipment and materials
- Design a product and make sure that it works for the given purpose
- Select the most appropriate tools and techniques for a given task
- Make a product which uses mechanical components
- Work accurately to measure, make cuts, holes and join materials
- Describe how food ingredients come together and have knowledge of where all the ingredients originated





**Year 4**

**Designing:**

- Use research to develop a design that is innovative, functional, appealing and fit for purpose for a specific group of people
- Generates, develops and models ideas through discussion, annotated sketches, prototypes, cross-sectional, exploded diagrams and computer-aided designs

**Making**

**Key Vocab**

<b>Materials</b>	Cut materials accurately to the nearest millimetre and safely using a wide range of different tools Apply appropriate cutting and shaping techniques that include cuts such as slots and cut outs Use a range of joining techniques dependent on the material	<b>Seasonality</b> <b>Parallel circuit</b> <b>Armature</b> <b>Cams, gears, pulleys</b> <b>Components</b> <b>Aesthetics</b> <b>Modify</b> <b>Three-dimensional</b>
<b>Textiles, Electricals &amp; Electronics</b>	Create series and parallel circuits Include an electrical element (light, buzzer, etc) in a construction	
<b>Construction &amp; Mechanics</b>	Use wood or a similar material to create a sturdy frame for a model (armature); use different tools and joining techniques to strengthen the structure and add stability Use joints (such as a Butt or Mitre) to join materials Use knowledge of transference of force to choose an appropriate mechanism for a construction eg pulley/gears/cams etc Incorporate an electrical and mechanical element into a construction	
<b>Computing</b>	Use IT to control and monitor models using software	
<b>Food Technology</b>	Understand and apply the principles of a healthy and varied diet Accurately measure and hygienically prepare ingredients using appropriate utensils Prepare and cook savoury dishes using a range of cooking techniques e.g. baking, boiling, steaming, grilling, etc. Understand seasonality and know where and how a variety of ingredients are reared, grown, caught and processed	
<b>Technical Knowledge</b>	Use knowledge of how to reinforce more complex structures using different joining techniques Understand how they can use different techniques (mechanical systems – cams, gears, pulleys) in their construction Understand how to incorporate electrical circuits (buzzers, switches, lights) into their construction	

**Evaluating:** Pupils should be given the opportunity to:

- Analyse their finished product against their design brief and summarise their successes and areas to improve
- Receive feedback on their designs and consider how this could help them make improvements
- Understand how key events and people in Design and Technology have helped shape the world



### Year 4 Designers should be able to

- Use ideas and feedback from other people when they are designing
- Use IT to produce a plan and explore different variables (size, shape, materials, etc)
- Measure and prepare ingredients and materials with accuracy
- Know how to be both hygienic and safe when using preparing and cooking food
- Know how different cooking techniques will affect how food tastes and looks
- Understand how seasons affect the availability of fresh produce and the journey from field to table for a range of ingredients
- Make a construction with a build base that has both an electrical and mechanical element



**Year 5**

**Designing:**

- Use research to develop a design that is innovative, functional, appealing and fit for purpose for a specific individuals or groups
- Generates, develops and models ideas through discussion, annotated sketches, prototypes, cross-sectional, pattern pieces and computer-aided designs

**Making**

**Key Vocab**

<b>Materials</b>	Choose appropriate tools to cut and shape a range of materials Cut materials with precision and refine the finish with appropriate tools eg sanding wood after cutting Show an understanding of the quality of different materials and explain choices	<b>Three-dimensional</b> <b>Fastener</b> <b>Seam allowance</b> <b>Pattern pieces</b> <b>Angled joints</b> <b>Engineer</b> <b>Nutrition</b> <b>Hacksaw</b> <b>Triangular support</b> <b>Back, cross, blanket stitch etc</b>
<b>Textiles, Electricals &amp; Electronics</b>	Create circuits that include a number of components eg buzzers, switches, lights, etc Include an electrical element (light, buzzer, etc) in a construction Design and create a pattern template which is used for an object with a seam allowance and fastener	
<b>Construction &amp; Mechanics</b>	Use wood or a similar material to create a 3D structure that has multiple joints, different angled joints, triangular supports Use practical skills such as cutting, drilling, screwing, nailing, gluing and sanding Use combinations of electronics or computing and mechanics in products	
<b>Computing</b>	Write code to control and monitor models of products	
<b>Food Technology</b>	Understand importance of correct storage and handling of ingredients Create and refine recipes for a savoury dish including ingredients, preparation methods, cooking method and times and temperature Explain choices of ingredients with reference to seasonality and suitability	
<b>Technical Knowledge</b>	Use knowledge to design and construct a sturdy 3D model with different joints for different purposes Understand how to plan and draw a template that has a seam allowance and a flap for a fastener Understand and successfully use electronics in a construction (lights, buzzers, switches, etc)	

**Evaluating:** Pupils should be given the opportunity to:

- Investigate and analyse a range of existing products; use this information for their own designs
- Learn about a key person who has influenced design and technology e.g. Dyson



### Year 5 Designers should be able to

- Come up with a range of ideas after collecting information from different sources
- Produce a detailed, step-by-step plan and / or template for a model or an object
- Explain how a product will appeal to a specific audience
- Evaluate appearance and function against original criteria
- Use a range of tools and equipment competently and produce a finished product with multiple electronic and mechanical elements
- Show that they can be both hygienic and safe in the kitchen
- Understand the source of ingredients and how to store them safely



**Year 6**

**Designing:**

- Use market research to develop a design that is innovative, functional, appealing and fit for purpose and communicates nutritional information
- Generates, develops and models ideas through discussion, annotated sketches, prototypes, cross-sectional, pattern pieces and computer-aided designs

**Making**

**Key Vocab**

<b>Materials</b>	Use precision cutting after a rough cut-out of a shape for an object Apply any finishing techniques as needed to use the material in constructions Show an understanding of the quality of different materials and explain choices	<b>Market research</b> <b>Environment, climate,</b> <b>Innovation</b> <b>Precision</b> <b>Rough-cut</b> <b>Ratios – scale up/down</b> <b>Micro-organism</b> <b>Tactile</b>
<b>Textiles, Electricals &amp; Electronics</b>	Select different qualities of materials to create suitable and tactile effects when using textiles eg soft decoration for comfort Join textiles with a combination of stitching techniques appropriate to the purpose (eg back stitch for seams, running stitch to attach decoration) Create circuits that include a number of components	
<b>Construction &amp; Mechanics</b>	Use practical skills such as cutting, drilling, screwing, nailing, gluing and sanding to create products Use combinations of electronics or computing and mechanics in products Convert rotary motion to linear motion using cams	
<b>Computing</b>	Write code to control and monitor models of products	
<b>Food Technology</b>	When storing and handling ingredients use knowledge of micro-organisms Create and refine recipes for a savoury dish including ingredients, preparation methods, cooking method and times and temperature; adjust quantities to scale up /down for specific purposes Understand how to calculate nutritional information of a product	
<b>Technical Knowledge</b>	Use knowledge to design and construct a sturdy 3D model with different joints for different purposes Understand how to plan and draw a template that has a seam allowance and a flap for a fastener Understand and successfully use electronics in a construction (lights, buzzers, switches, etc) Applies understanding of computing to program, monitor and control products	

**Evaluating:** Pupils should be given the opportunity to:

- Investigate and analyse a range of commercial products; use this information for their own designs
- Learn about a key person who has influenced design and technology e.g. Lloyd Wright, Hadid



### **Year 6 Designers should be able to**

- Use market research to inform their plans and ideas and be able to work within a set of given parameters
- Follow, refine and justify their plans in a convincing way
- Show that they consider culture and society in their plans and designs
- Show that they can test and evaluate their products against a set of clear criteria
- Explain how products should be stored and give their reasons
- Understand how to adjust a recipe for different purposes eg different numbers, less spicy, more nutritional value, etc.